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Research review

Are female athletes at increased risk for disordered eating and its complications?

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ABSTRACT

The purpose of the study was to make a systematic review and describe and confront recent studies that compare the presence of disordered eating and its complications in young female athletes and controls subjects – PubMed, Scielo, Medline, ScienceDirect, WILEY InterScience, Lilacs and Cochrane were the databases used for this review. Out of 169 studies 22 were selected and 11,000 women from 68 sports were studied. The short version of the EAT was the most common instrument used to track disordered eating. Results showed that 55% found no significant difference in the percentage of disordered eating between athletes and controls. Also a higher percentage of studies reported higher frequency of menstrual dysfunction in athletes than controls and finally 50% of the studies found incidence of low bone mass in controls. Not all the studies that investigated all the conditions in the triad, but the authors concluded that it seemed that athletes were in more severe stage of this disorder. Due to the heterogeneity of the studies, a definitive conclusion about the groups and at highest risk for disordered eating and its complications remains to be elucidated.

Contents

Introduction

The cultural emphasis given to weight and body shape points towards a "beauty standard" centered on thinness (Silva, 2001). The anorexic example of "perfection" that parades on catwalks turns out to be the dream of teenagers and young adults around the world, taking them to extremes in search of the ideal body stereotype (Polivy & Herman, 2002). The influence of the body cult and the pressure to be thin that is experienced by Western societies seems to be associated with the onset of eating disorders (Tremblay & Lariviere, 2009).

Eating disorders are behavioral syndromes associated with considerable morbidity that present one of the highest mortality rates among mental illnesses (Marquéz, 2008). This clinical mental disorder is defined by the American Psychiatric Association (APA, 2000) and the World Health Organization (WHO, 1992) as abnormal eating behaviors that can be diagnosed only by strict criteria. As a result of this limitation, the number of people presenting pathological eating behavior is actually much larger than those diagnosed.

Disordered eating is characterized by abnormal eating behaviors, including restrictive eating, fasting, frequently skipping meals, overeating, and binge-eating followed by purging

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(vomiting), as well as the use of diet pills, laxatives, and diuretics (Nattiv et al., 2007). But these are not all of the criteria for diagnosing eating disorders. Generally, disordered eating behaviors are accepted as a non-clinical concept and originate from self-reported scales (Vardar, Vardar, & Kurt, 2007).

The investigation of disordered eating behaviors and the identification of at-risk groups are essential for early recognition of the problem, thus preventing progression to more serious eating pathology (Quatromoni, 2008). It is clear that 95% of disordered eating cases occur among women (Espíndola & Blay, 2006) and that 90% of cases occur in people under the age of 25 (Deering, 2001). However, it is less clear whether the sports environment is a risk factor or protective factor (Holm-Denoma, Scaringi, Gordon, Van Orden, & Joiner, 2009).

Female participation in sports has increased substantially over the past 10 years and this growth may bring health concerns (NCAA, 2003). The benefits that sports practice can bring are undeniable, such as the increase of self-esteem that may serve as a protection against the development of disordered eating (Smolak, Murnen, & Ruble, 2000). However, competitive sports are not always synonymous with balance and health. The physiological changes and the nutritional stresses generated by strenuous exercise can lead the athlete to the boundary of health and disease (Lukaski, 2004). Moreover, pressure to maintain a low body weight exerted by coaches, relatives and friends, as well as a lack of professional guidance can make an athlete vulnerable to the onset of disordered eating, compromising her performance (Panza, Coelho, Di Pietro, De Assis, & Vasconcelos, 2007).

Disordered eating is part of the "female athlete triad" along with amenorrhea and bone demineralization (Khan et al., 2002; Nattiv et al., 2007). This combination of pathological weight control measures and hormonal disturbances can lead to serious consequences, not only for sports performance, but also for health on a long-term basis.

To date, literature reviews (Byrne & Mclean, 2001; Hausenblas & Carron, 1999; Smolak et al., 2000) have reported only suggestive but inconclusive results in the comparison of disordered eating risk among athletes and non-athletes, many times because of the methodological problems of the studies researched. Given these situations, there remains a question mark about the relationship between sport and disordered eating in young women. Clarifying this question is extremely important because if sports participation increases the risk for disordered eating, then prevention programs, guidelines, and policies focused on female athletes become essential. Therefore, the purpose of this review was to describe and confront recent studies that compare the presence of disordered eating and its complications in young female athletes and non-athletes.

Methods

The methods section of this study was based on the procedures for a systematic review produced by the NHS Centre for Reviews and Dissemination (2001).

Search strategy

The keywords for disordered eating were used along with keywords for athletes in order to locate potentially relevant studies. The keywords included were eating behavior, disordered eating, eating disorder, female athlete triad (FAT), nutrition, food, athletes, exercise, and physical activity. The literature research was conducted in 2009 by consulting the following electronic databases: PubMed, Scielo, Medline, ScienceDirect, WILEY Inter-Science, Lilacs and Cochrane. In addition to electronic research, reference lists of review studies were screened for titles that included the keywords.

Inclusion and exclusion criteria

The retrospective search was limited to scientific articles (i) indexed, (ii) published within the last 9 years, (iii) written in English, Spanish or Portuguese, (iv) that included, as research participants, female athletes and non-athletes aged between 12 and 35 years old (or with a mean age within these limits), (v) that identified the presence of disordered eating through standard self-administered questionnaires, clinical interviews, and/or self-monitoring. Studies that had no control group, intervention studies, case studies, and reviews were excluded.

Identification of relevant studies

The literature research process involved two steps: in the first one, 1532 articles were located by keywords. Then; after reading the titles and abstracts; we excluded 12 validation studies; 16 articles written in another language; 27 case studies; 621 studies that did not address the required issue and 687 literature reviews; leaving 169 studies.

In the second step, 2 researchers read the 169 articles, to look for the inclusion criteria previously mentioned. We excluded 129 studies for not using a control group, 14 for not separating participants by sex and 6 for using non-validated measures to screen for disordered eating, leaving 20 articles. We included 2 studies by the references search, totaling 22 reviewed studies.

Data extraction

Data from selected studies were extracted by two researchers on standardized forms developed for this review.

Because this study aimed to compare the presence of disordered eating and its complications between female athletes and non-athletes, we extracted information regarding only the female population divided into two groups, the athlete group and the control group, and we exhibited only the results regarding disordered eating and its possible complications, even when the study researched both sexes, different groups, and other outcomes. This population was chosen for being the group at highest risk for developing disordered eating. Moreover, in recent years, the number of women practicing diets due to concerns over body shape (or body image) increased approximately 300% and in the adolescent population, this increase was 1300% (Philippi & Alvarenga, 2004), strengthening the justification for our choice of population.

The following data were extracted: authors; year and country of study; population subdivided into athlete group and control group; mean age or age group of the athlete group and control group; number of studied sports (NSS); methods used to identify disordered eating, low energy availability (LEA), eating disorders, menstrual irregularities (MI), bone lesions (BL), low bone mineral density (LBMD), biochemical profile, and/or female athlete triad; main results subdivided into athlete group and control group; group at highest risk for disordered eating; and conclusions.

These details are summarized in Table 1.

Results

Countries in which the research was conducted are distributed as follows: United States of America (USA) ($n = 7$), Norway ($n = 5$), Brazil ($n = 2$), France ($n = 2$), Japan and China ($n = 1$), United Kingdom and Kenya ($n = 1$), United Kingdom only ($n = 1$), Spain ($n = 1$), Australia ($n = 1$) and Germany ($n = 1$).

All reviewed studies were cross-sectional and included female subjects. Three studies (Dempsey, Wiemann, Moreland, & Anding, 2004; Litchfield & Westberg, 2003; Okano et al., 2005) did not